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RECEIVED 11 July 2023

ACCEPTED 20 February 2024

PUBLISHED 20 March 2024

## CITATION

Dumitru C, Stan MM and Dumitru G (2024)  
Academic support through tutoring, guided  
learning, and learning diaries in the context of  
the COVID-19 pandemic: an experimental  
model for master's students.  
*Front. Educ.* 9:1256960.  
doi: 10.3389/feduc.2024.1256960

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# Academic support through tutoring, guided learning, and learning diaries in the context of the COVID-19 pandemic: an experimental model for master's students

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**Introduction:** Engaging students in co-planning their learning paths, peer cooperation, tutoring, and network building in an inclusive and project-based environment has been associated with higher academic and professional success. However, university teachers face challenges in offering guidance and academic supervision to optimize student learning, particularly in the context of online learning. This study aimed to investigate the effectiveness of adapting collaborative learning environments, peer tutoring, and academic supervision in the online learning space.

**Methods:** An experimental design methodology was employed to investigate the impact of collaborative learning environments, peer tutoring, and academic supervision on student engagement, interest, and dedication to learning.

**Results:** The findings showed direct positive effects on the level of engagement (VI;  $M = 23.18$ ,  $SD = 5$ ), higher interest and dedication to the learning process (DE:  $M = 26.93$ ,  $SD = 3.21$ ), and better concentration and enthusiasm while studying (AB,  $M = 24.83$ ,  $SD = 8.52$ ).

**Discussion:** The results suggest that adapting to online learning by providing collaborative learning environments, peer tutoring, and academic supervision can enhance student engagement and motivation. Further research is needed to explore the long-term effects and scalability of these interventions in diverse educational contexts.

## KEYWORDS

academic engagement, academic support, higher education, learning diaries, reflective practice

## Introduction

Today, higher education systems are continuously evolving, providing more flexible programs to better respond to social, political, and economic needs. Interest in higher education research has increased recently due to the significant expansion of higher education

(Brennan and Teichler, 2008) and its resulting greater economic impact. As noted, there has been a continuous shift from direct instruction to interactive learning, resulting in more flexibility and hybrid approaches. Extensive research has emphasized the importance of an inclusive and interactive learning environment, defined in terms of participation, engagement, motivation and collaborative work, for better outcomes during master's studies (e.g., Hadwin and Winne, 1996; Dunlosky and Rawson, 2015; Westerlaken et al., 2019). Interactive and experiential methodologies are positively linked to students' success, impacting academic achievement, satisfaction with university life, and careers and educational endeavors (e.g., Frank and Barzilai, 2004; Cuseo, 2018; Ely, 2018). In this literature review, we gathered and identified studies that explored the influences and impact of peer collaborative learning, tutoring, and effective academic supervision on students' experiences in higher education. The rationale for this study is built on the assumption that although master students are independent learners, their need for effective academic supervision and engaging learning conditions is still strong. As learners move from bachelor education to higher education (master and doctoral studies), their learning becomes less supervised, favoring a more autonomous and independent approach.

Collaborative learning, peer-tutoring, and academic supervision have attracted the scientific attention of a permanently increasing number of individual researchers or research teams. This is found to be challenging, especially from the new perspective of university hybridization (Graf, 2013). The hybridization process is undertaken by universities to digitalize their services and to design remote online study programs. During this process, universities should (re)think their role in providing the necessary tools to ensure "autonomous learning during unmonitored online learning processes" (Arefian, 2022, p. 623). Collaborative learning, tutoring and supervision are linked to fruitful accomplishment: nevertheless, investigations show that university students do not initiate metacognitive skills to optimize their learning process and to overcome difficulties (e.g., Hendriksen et al., 2005; Zimmerman, 2008; Koulianou and Samartzis, 2018). Collaborative learning in online settings can be ensured by providing a particular space for learners' personal reflection and several self-regulatory activities (Rocco, 2010; Peacock and Cowan, 2017).

A great extent of studies shows that engaging students in co-planning their learning paths, as well as providing teacher and peer cooperation, tutoring, and network building in an inclusive and project-based environment are associated with the improvement of academic and professional success (Ahlfeldt et al., 2005). Besides the difficulty of obtaining a theoretical foundation and research findings, universities teachers find it challenging to offer guidance and academic supervision to their students to optimize their learning or do not find it crucial to practice and facilitate self-guidelines skills (Ahlfeldt et al., 2005; Alt and Raichel, 2020). Furthermore, studies have proved that students need extra help to practice and develop these abilities, for instance, through modeling (Raaijmakers et al., 2018), or academic mentoring (Goodnough, 2010; Lunsford et al., 2017). Collaborative learning, academic mentoring and metacognitive strategies are correlated with higher results, like scholastic accomplishment (Taylor et al., 2014) and better learning outcomes (Allan, 1996). Students can actively participate in building networks, receiving guidance and mentoring while being autonomous learners, adding significant worth to their learning.

## Theoretical framework

New pedagogical directions aim to develop academic competencies and increase reflection while providing an inclusive learning environment to enhance community building and the continuous trainer-trainee relationship. Academic support and supervision, along with implementing metacognitive procedures, lead to deeper reflection by students on their own learning processes, significantly impacting the knowledge acquired. The implementation of the monitoring and self-monitoring framework shows improvements in personal, social, and professional dimensions (Cho and Linderman, 2019), as well as enhancements of emotional engagement and social skills (Ee et al., 2009; Oksanen et al., 2017), and increased learning performance in online education (Anthonysamy, 2021).

Learning occurs not only in the classroom but also outside, particularly in higher education, during individual study activities, project-based learning, and the transfer of knowledge into practice (work-practice at master level). Shifting to more independent learning, master's students benefit from support complementary to the classroom, namely academic supervision. Studies have revealed some positive effects of academic coaching on students' metacognition (Howlett et al., 2021), students' well-being (Field et al., 2013), students' performance, and retention (Alzen et al., 2021), and students' lifelong learning skills (Hauer et al., 2022). Tutoring and working in small groups under the supervision of a professor represent an opportunity to develop learning and research communities, allowing the continual sharing of learning experiences with constant and immediate feedback, increasing participation in educational and practical activities, and creating meaningful and relevant learning conditions. Another learning enhancer with great impact and benefits on students' learning outcomes is reflection. Although the concept of reflection is not fully known and explored, it has a high-impact on practice in higher education (Hickson, 2011; Camus et al., 2021). Rogers (2001) gathered research perspectives on the process of reflection, ranging from action to metacognitive reflection, from reflective learning to reflective thinking, from critical reflection to mindfulness. Reflective skills have been proven to be a valid means of increasing students' active learning (Calderhead and Gates, 1993).

The goal of transformative education is to enable university faculty to prepare teachers with strategies to transfer reflective skills into practice, through developing articulated thinking, and monitoring exercises (Pellegrino, 2013). In higher education contexts, interaction with faculty in instructional activities (explaining, providing instant-corrective feedback, scaffolding) is considered an interactive activity if students are engaged and actively participate by responding in a meaningful and substantial way.

## Collaborative learning and peer interaction

Collaborative learning requires the participation of at least two members and up to groups of six students (Udvari-Solner, 2012) with the aim to contribute and engage actively in the learning process. In higher education, the benefits of collaborative learning activities are the dynamism and co-creation of educational content. Common activities in higher education guide students to work in groups,

facilitating peer interaction and peer learning. Collaborative learning creates optimal conditions for the interaction between students to exchange experience, knowledge, and information, forming ties and creating communities based on the principles of support and mutual assistance (Chi, 2009). Moreover, the teacher does not act as a source of new knowledge but as a creator and facilitator of the educational process. Peer-to-peer interaction is a form of active learning. Collaborative learning and peer interaction through discussions and common projects model the relationship among students. In the process of peer learning-interaction, students learn to face challenges while the influence of the teacher is reduced. “Collaboration is a critical feature of self-study research” (Carse et al., 2022, p. 127), facilitating the “We-Me” dialog (Carse et al., 2022).

## Academic support and learning diaries

In higher education, the responsibility for acquiring knowledge and skills mainly falls on students’ shoulders. To overcome some insufficient pedagogical knowledge and skills of the students involved in collaborative learning and interaction, higher education professors can guide and provide valuable feedback regarding students’ learning process through academic support and encourage self-education. University professors have the role of regulating the learning process by providing constant feedback on how learning happens and supporting students with tools to stay on the learning path to reach their educational goals. This reflective activity is related to the individual and autonomous learning and is fostered by self-regulated learning (SRL). SRL refers to certain learning behaviors such as planning, setting specific learning objectives, selecting appropriate strategies to attain certain academic results (Ben-Eliyahu and Bernacki, 2015), screening and assessing their intellectual cycles. In the new digitalized and technologically enhanced learning environment, master students can be in contact with their teachers all the time, mentors, and colleagues, and become more efficient in planning, organizing, and monitoring their academic performance. Developing reflective skills can help students track and store their learning behavior and academic performance during a study session. All reflective exercises and skills allow students to become more self-aware of their learning process and better understand how to improve their academic performance.

To enhance students’ academic performance, teaching methods extensively incorporate self-monitoring tools, aiding students in focusing on observing, reflecting, and monitoring their learning or the learning material (Fabriz et al., 2014). In the process of self-regulated learning, students actively engage in self-awareness, self-motivation, and behavioral competence to elevate their proficiency in constructing and applying knowledge effectively (Ferreira et al., 2015). The literature, including Roth et al. (2016), places significant emphasis on the role of learning diaries and academic support in improving the overall learning experience.

Academic support encompasses various resources and guidance provided to students to ease their learning path, involving workshops, tutoring, and personalized assistance from instructors. The goal of academic support is to facilitate students’ understanding of course content and the development of essential skills (Collins and Sims, 2013). Learning diaries, commonly used as reflective tools by students, allow them to document their learning processes, experiences, and insights

over time. Through regular entries, students articulate their goals, track progress, and engage in self-assessment. Being a dynamic instrument, learning diaries enhance metacognition, encouraging students to think critically about their learning strategies, challenges, and achievements. This reflective practice contributes to a deeper understanding of the subject matter and the cultivation of lifelong learning skills.

The use of academic support and learning diaries in higher education helps students develop a sense of learning achievement (Anthony et al., 2020). Academic support services provide the necessary guidance, while learning diaries offer a personal space for students to internalize and articulate their learning. Both academic support and learning diaries contribute to a more effective educational experience, promoting self-directed learning and holistic student development.

Metacognitive behaviors consist of assessment and evaluation exercises that help students keep track of their progress through learning and can generate a reflective and introspection process to identify the difficulties encountered in the learning process, monitor, and adjust accordingly to the learning objectives. Extensive studies supported the use of metacognitive procedures and reflection to optimize learning and guide learners and teachers to accomplish goals (Dignath and Büttner, 2008; Efklides et al., 2018; Alt and Raichel, 2020); better decisions at workplace (Pintrich, 2004); academic accomplishment (Taylor et al., 2014). Key to innovation in encouraging practice in master training is through fostering crystallization of learners’ communities by supporting their educational thinking as a result of practicing reflective thinking and metacognitive procedures, as well as by providing dynamic practices based on an academic supervision program. Improvements in educational practices at the master level can be transferred from the experiences related to academic supervision and peer-tutoring systems due to an increased comprehension of related instructional needs and a more practical approach. Educational programs can be improved by considering students as actors in their learning and career development path.

Studies (Schmitz et al., 2011; Schefer-Wenzl and Miladinovic, 2021) show the great impact of metacognitive procedures, such as learning diaries, in raising awareness of students toward their learning process, by measuring their progress on a daily or weekly basis. “Learning journals or diaries may provide a springboard for such internal discussions with self” (Peacock and Cowan, 2017, p. 5). Moreover, the benefits of learning track instruments are confirmed, especially in online or hybrid educational settings, where the learning process is frequently fragmented (Schefer-Wenzl and Miladinovic, 2021), despite the illusion of permanent and ongoing contact between learners and professors. Higher education requires a high degree of engagement, independent learning and self-organization skills; however, even master students lack solid SRL skills (Ahlfeldt et al., 2005; Anthony et al., 2021). Learning diaries are used either in a structured or unstructured way to provide structure and consolidate learning. These tools are used to assess one’s learning and to improve SRL by tracking content transfer and facilitating knowledge construction. Furthermore, diaries enhance learners’ motivation by providing instant feedback and detection of small daily increments in skills building (Schmitz et al., 2011), with a high impact on learning satisfaction. Yet, there is a need to explore the use of learning diaries in higher education and the adaptation and insertion of such tools to the specific requirements within master programs in online settings.

## Rational of the study

This study is motivated by the need to analyze the learning environment (defined in terms of participation, engagement, motivation and collaborative work) to achieve student success at university. Moreover, with the outbreak of COVID-19, online learning is becoming very popular. To provide ongoing learning, universities are digitizing their services and (re)designing their programs, mainly postgraduate programs, for the online environment. Considering the new dynamic changes in higher education and the increasing popularity of remote learning, a new learning environment emerges. In the process of transferring the teaching content from on-site to an online or hybrid learning environment, studies are needed to identify appropriate teaching models and techniques, adequate technological tools to cope with remote learning barriers, and support strategies to maintain a sufficient level of engagement, motivation and participation of students and teachers as well. In the context of the shifting to a hybrid space, this research contributes to a better understanding of learning dynamics (students' learning behaviors) and student engagement in master's programs by analyzing how learning opportunities are created in peer tutoring groups during academic practice and how to transfer academic supervision to an online learning environment.

## Research methodology

This study investigated how, in the new context of shifting to online learning space, universities should adapt and still provide collaborative learning space for peer-tutoring and academic supervision activities. Understanding this process can help provide students with effective support in their learning cycles during this transition period.

The research was designed to investigate and measure the effects of peer-collaborative learning versus individual preparation during master programs and the impact of academic supervision to maintain engagement and motivation during online learning. Our research methodology involved a mixed-methods approach, with qualitative data (self-reflection from learning diaries) and quantitative data (questionnaire responses) being collected concurrently.

The research study had the *following objectives*: (O1) Understanding the impact of learning diaries in enhancing learning monitoring skills and facilitating the process of providing feedback during master studies; (O2) Critically define the processes of tutoring and supervision in the online learning format; (O3) Measuring learning engagement of Master students while studying as a result of developing monitoring skills through learning diaries and academic support; (O4) Increasing the efficiency of university training of master's students through the academic supervision (based on a tutoring program) and project-based learning (PBL) approach.

## Research questions

This study *investigated* how universities should adapt to the online learning space to provide online collaborative learning opportunities, peer-tutoring and academic supervision as forms of learning and

teaching for higher education in Romania. The following research questions were addressed in the study: (RQ1) Does peer-collaborative learning increase participation and motivation among master students in the online learning environment? (RQ2) Does the reflective methodology, based on learning diaries, and teachers' academic supervision, help students develop their reflective skills in each phase of their study activity preparation, performance, and self-reflective phase (Peters-Burton and Botov, 2017)? Participants from the experimental group were prompted to use peer-collaborative learning and benefited from academic supervision. The following *hypotheses* were posed:

*H1*: Does constant academic supervision, provided by a PBL tutoring program in an online environment, predict higher levels of engagement? As noted previously, prior findings show that the drop out in an online learning environment is correlated with the lack of constant interaction and feedback from the teachers and tutors (Jacobsen, 2019; Rawat et al., 2021).

*H2*: Is academic engagement influenced by the students' learning experience (measured in years enrolled in education)?

## Participants

To perform the experiment, the data of interest were collected from participants enrolled in Educational Sciences Masters at the University of Pitesti (Educational Management and Early Education) in the academic years 2020/2021 and 2021/2022. A total of 230 master students who had enrolled in Educational Sciences Master at the University of Pitesti participated in the study, based on a convenient sampling, in October 2021. Of 230 students, 5 were excluded from the analysis (due to incomplete attendance). Participants' socio-demographic data can be found in Table 1. Of the remaining 225 students, 91 (39% response rate) responded to *Utrecht Work Engagement Scale-9S* (UWES-9S) (Schaufeli, 2017) and 49 (53% participation rate) students engaged in the learning activities designed during the Experimental Condition (EC). During both academic years, courses were held online through the university e-learning platform. The peer-to-peer collaborative learning and academic supervision activities were made available online during the research project. The parameters relating to the research dimension (motivation, interest, engagement, participation) were determined through the analysis of UWES-9S administered post-experiment (January–February 2022).

## Instruments

To address these research objectives and questions, we conducted a mixed qualitative and quantitative methodology to explore and facilitate the understanding of a complex phenomenon. We used an experiment to test the impact of peer collaborative learning opportunities, tutoring, and effective academic supervision in an online learning environment. To collect the required data, two major instruments were used. The instruments comprise an *academic*

*learning diary* to monitor learning behaviors used by students to prepare for the course, during the course, and after the course during independent study activities. The learning diary instrument, was designed based on the framework proposed by Peters-Burton and Botov (2017), including: (1) Forethought Phase: Pre-acquisition, Prior Experiences, Organizing what is known and identifying knowledge gaps, Goal settings, Task orientation, Goal orientation, Self-efficacy, Strategic planning, Task interest; (2) Performance Phase: Applying learning strategies to create knowledge, Attention, Self-instruction, Self-monitoring; and (3) Self-Reflection Phase: Self-evaluation, Attribution, Self-reaction, Adaptability. This coding process enabled us to extract valuable qualitative insights into students' learning behaviors. The frequency of specific behaviors was recorded, providing rich data for the subsequent qualitative analysis of students' learning experiences. For the qualitative analysis, we used the framework provided by Ritchie and Lewis (2003). The Utrecht Work Engagement Scale for Students (UWES-9S) (Schaufeli, 2017) was applied for a post-test phase to assess the level of academic engagement, organized into three subscales (i.e., vigor, dedication, and absorption). For the Romanian cultural context, UWES-9S was translated and adapted in 2009 by Virgă et al. (2009), and used during several studies on the student population (Ștefenel and Neagoș, 2020). The UWES-9S (Student version) was given to both the experimental and control groups as a post-project evaluation to help the researchers assess the impact of academic supervision to foster learning in an online setting.

## Procedure

The quasi-experimental research, conducted during the academic year 2021–2022, targeted second-year teacher-training students enrolled in master courses. The participants attended online courses in the first semester and hybrid-mode courses in the second semester. Two Master programs, Early Education and Educational Management, were designated for the study. The experimental group, emphasizing peer-tutoring and academic supervision, consisted of Early Education and Educational Management master programs. The control group included participants from Early Education and Educational Management master programs who followed traditional online courses. The objective was to compare the learning environment preferences between the experimental group, engaging in structured peer-to-peer collaborative learning, and the control group, adhering

TABLE 1 Participants' socio-demographic data.

Variable	EC (n = 49)	CC (n = 42)
<i>Gender</i>		
Female	46 (93.87%)	37 (88.09%)
Male	3 (6.13%)	5 (11.9%)
<i>Age (years)</i>		
Media	32.69 (Range 22–52)	31.27 (Range 22–48)
SD	10.5	9.32
<i>Study program</i>		
Educational management	24 (48.97%)	19 (45.23%)
Early education	25 (51.03%)	23 (54.77%)

to standard online course formats. Post-experiment, the UWES-9S questionnaire was administered, and participants were instructed to track their learning strategies and behaviors throughout the experiment. Participants received the instruments (questionnaires) through Google Forms along with a study description and a consent form. After obtaining informed consent, participants privately completed the questionnaires with assured anonymity. The Ethics Committee of the Centre for Scientific Research in the Field of Applied Psycho-Pedagogy approved the research (protocol number: 226/12.02.2021).

## Experimental condition: strategies used in PBL

In the experimental group, a 10-week intervention program was implemented, consisting of 20 workshops delivered via Zoom. Participation was voluntary, and students were well-informed about the research's purpose and potential impact on evaluations. The workshops were designed in alignment with the curriculum and focused on collaborative activities, common projects, self-assessment skills, and non-formal interactions. Teachers provided prompts for learning diaries and facilitated peer-learning. Data collected from the workshops were analyzed using SPSS.

## Course design and instructional approach

A course from the Early Educational Master Program, "Inclusive Early Childhood Education," was selected for the study. The course content was redesigned to emphasize small-group interactions and constant academic supervision. Sessions included collaborative, exploratory, and PBL tasks. The course design incorporated handouts, worksheets, and online discussions to support collaborative and autonomous learning. Formative dynamic evaluation, think-aloud techniques, and case study presentations were integrated to encourage reflection, critical thinking, and knowledge transfer. The final evaluation involved a collaborative problem-solving activity where master students proposed educational interventions for real-life case studies (Matsuda et al., 2015). The think-aloud technique was used for formative dynamic evaluation, providing insights into the effects of the course design on learning behaviors. The course design aimed at active knowledge (re)construction in a collaborative online environment, focusing on the development of teacher expertise and evidence-based decision-making (see Table 2). The instructional approach aligned with project-based instruction principles, promoting knowledge construction through collaborative processes (see Table 3 for the experiment protocol).

TABLE 2 Workshop titles (EC).

Learning content of the sessions
1 Defining learning-appropriate goals that lead to a deep understanding
2 Developing peer-group and working on the group cohesion to promote participation
3 Ensuring multiple opportunities for formative self-assessment and revision
4 Providing scaffolding as a learning tool based on a structured academic supervision

TABLE 3 Experimental and control condition implementation protocol.

Experiment phase	
1	Preparing for class sessions (for both teachers and students) (with the aim to develop study habits)
2	Consulting literature and sources outside the syllabus and having a space for discussing the latest findings with relation to the course subject
3	Participating in class and content creation
4	Constant feedback through the forum and chat tools offered by the university platform allows a continuous learning space
5	Learning diaries (participants will keep a learning diary during the entire course and will hand them diaries to the lecturer). The benefit of the student would be the objective learner development and teacher feedback for future learning improvement (Zimmerman, 2008).
Control phase	
1	Using material from class sessions and objectives
2	Reading assigned material
3	Taking notes in class sessions

TABLE 4 Coding scheme—students’ reported monitoring-learning behavior (percentage scores).

	Outcomes (learning behaviors)	Percentage
<i>Forethought phase</i>		(n = 49)
	No particular preparation	10.2
	Pre-acquisition	8.12
	Prior experiences	51.02
	Identifying knowledge gaps	12.24
	Updating previous knowledge	26.53
	Goal settings	24.48
	Task orientation and interest	26.53
	Goal orientation	71.42
	Strategic planning	32.65
<i>Performance phase</i>		
	Applying learning strategies to create knowledge	75.51
	Self-instruction	4.08
	Peer-learning	16.32
	Tutoring	28.57
<i>Self-reflection phase</i>		
	Self-evaluation	83.67
	Attribution	46.93
	Self-reaction	34.69
	Adaptability	65.30

The percentage scores refer to the number of students who selected a behavior that was coded in a specific outcome (learning behaviors).

## Results

### Learning diaries

A qualitative study was set up to provide in-depth information on students’ learning experiences during PBL and tutoring

programs to answer our research question (RQ1). The students (EC) (n = 49) were guided to use learning diaries before and after tutoring sessions and learning activities. Students were prompted to record their learning habits and behaviors undertaken during their learning process (before the course, during auditing the course and after finishing the course). The learning diaries were completed by students during the *Inclusive Early Childhood Education* course, which lasted one semester (14 weeks). Students submitted a minimum of five entries for their learning diaries, via the course platform. The data gathered from the learning diaries of students were collected for all the phases of the studying process. Students learning behaviors were afterwards content-analyzed and coded, the frequency of a specific behavior was recorded. The dimensions considered were the following: (1) *forethought phase* (Pre-acquisition, Prior Experiences, Organizing what is known and identifying knowledge gaps, Goal settings, Task orientation, Goal orientation, Self-efficacy, Strategic planning, Task interest), (2) *performance phase* (Applying learning strategies to create knowledge, Attention, Self-instruction, Self-monitoring), and (3) *self-reflection phase* (Self-evaluation, Attribution, Self-reaction, Adaptability), based on the framework proposed by Peters-Burton and Botov (2017). The code provided us with data to perform the qualitative analysis of students learning behaviors (Table 4). The data was coded by CD and confirmed by MMS.

Students’ learning diaries revealed relevant qualitative data on participants’ metacognitive processes, which emerged from some attributes mentioned above. Moreover, some other aspects identified during the process of keeping a learning diary show that most common learning behaviors that students undertook before lecturers were overall reading of the lecture notes, identifying a set of questions to be clarified during the course, highlighting unknown things and finding more information: (“I have written down the essential information and the issues on which I need additional information”), organizing what is known and identifying knowledge gaps. Before the experimental phase, students confessed that they did not set clear learning objectives previously for the courses or any other learning activities. During the experimental period, students’ learning diaries showed that students aimed at reducing the time needed for learning by identifying more efficient learning strategies, by identifying barriers to learning, identifying knowledge gaps, and by setting a study timeline. Therefore, learning diaries are an efficient tool for targeting learning goals. During the performance phase, students were instructed to describe the steps taken in the process of knowledge creation. The most common reported reflective thoughts on students’ own learning process were realizing what was expected to know and why they were required to know that particular content, identifying what needs to be learned, identifying and selecting the best way to acquire the knowledge, changing the perspective toward the study experience, and changing the level of effort put into the study process. Figure 1 illustrates the hierarchical value map of learning strategies and learning behaviors employed by students from EC during lectures, as reported in their learning diaries, providing a comprehensive overview of their educational approaches and preferences.

Some insights of master students on their monitoring of the learning process “First, I realized why I should know these things. Then I changed the way I felt about the study and thought about the best way

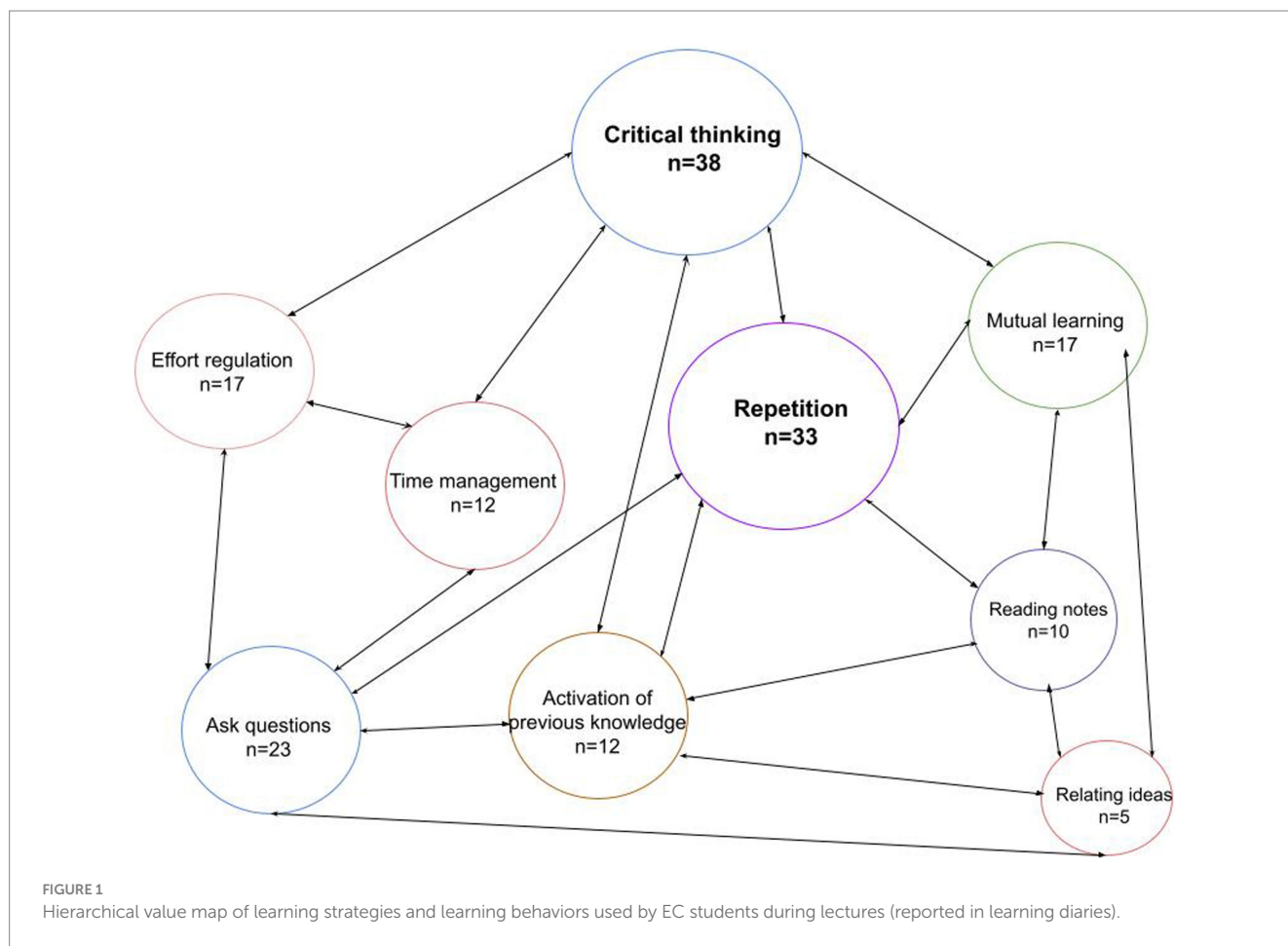


TABLE 5 Challenges in learning identified by master students.

Barriers to learning	Percentage (n = 49)
Fear of failure	63.26
Non-academic orientation	49.18
Intention to reproduce and not to process deeply the learned material	46.93
Disorganized study methods	24.48
Updating previous knowledge	18.36
Lack of clear learning goals	16.32
Lack of direction	10.20
Negative attitudes	2.04
Lack of interest	6.12

to read the course,” “First, I physically attended classes. Then, I went through the materials (course support, notes), I emphasized, I observed. I tried to understand the required tasks.”

During the Self-reflection phase, EC students reported that they were self-assessing how learning objectives have been achieved, assessing the relevance of the learned content, and assessing the understanding of the material. Some students’ self-reflective thoughts:

“I reflected on how I studied,” “I checked if my strategy (approach) had worked,” “I appreciated my current understanding of the new leaned material,” “I evaluated the effectiveness of the strategies I had used,” “I checked to see if my learning strategy (approach) was working and it moved my learning toward my goals,” “I kept track of time.” In their learning diary students were guided to identify their barriers to learning. The results are displayed in Table 5.

Students from the CC were not trained to monitor their learning process using a learning diary; thus, relevant data on the behavior regarding their preparation, performance and self-reflection phase was not available.

In order to enrich the depth of our findings and provide a more holistic understanding of the learning experience, we sought to bridge the qualitative aspects captured through learning diaries with corresponding quantitative metrics. For this purpose, we employed the UWES-9S – Student version Scale, a well-established instrument designed by Schaufeli (2017). Both instruments allowed us to not only delve into the nuanced reflections and experiences documented in the diaries but also to quantify aspects related to student engagement, well-being, and enthusiasm through the structured framework of the UWES-9S Scale. By adopting this mixed-methods approach, we aimed to attain a more comprehensive and nuanced perspective on the impact of our educational intervention. The rationale of this mixed methodology was to obtain a more nuanced and detailed portrayal of the impact of our educational interventions on student engagement and well-being.

## Students' engagement

To examine our research hypothesis, a reliability test was performed, to identify the internal consistency. “The internal consistency of the UWES-9 scales has values between 0.70 and 0.80 and the consistency for the unique factor is almost 0.90 that suggests a better adequacy for the single factor model” (Virgă et al., 2009, p. 58). The results of the quantitative analysis of student engagement to determine whether there is a significant difference between students' level of academic engagement (UWES-9S – Student version, Schaufeli, 2017) in EC students compared with CC students, which confirmed research hypothesis (H1). Academic engagement (vigor, dedication, and absorption), the dependent variable, was operationalized and measured by asking for intensity in engagement in performing different learning behaviors during their master program. Students rated each item using the following Likert scale: never/not a single time (=0), almost never/very few times per year (=1), sometimes/few times per year (=2), regularly/once a month (=3), several times/once a week (=4), often/several times per week (=5), and always/everyday (=6). Independent sample t-test was used to compare the effects of using PBL and tutoring programs on academic engagement for the experimental and control groups. According to the results for post-test scores, the mean scores between the two groups were significantly different, and the mean scores in the experimental group were higher than those in the control group. The results showed significant differences ( $p < 0.05$ ) for the VI and AB dimensions (Table 6).

Students from the EC scored higher than students from CC for the Absorption dimension (AB), which means that students from EC are more focused and absorbed in their studies, they feel more concentrated and satisfied while studying ( $M = 24.83$ ,  $SD = 8.52$ ), than students from CC ( $M = 19.95$ ,  $SD = 6.35$ ), a statistically significant difference,  $M = 4.88$ , 95% CI [1.7, 8.05],  $t(89) = 3.056$ ,  $p < 0.003$  was determined. Vigor dimension (VI) is significantly different for students from EC, they tend to have higher levels of energy and mental resilience while studying, more motivated to spend their time working and are persistent when faced with challenges ( $M = 23.18$ ,  $SD = 5$ ), than students from CC ( $M = 19.76$ ,  $SD = 6.21$ ), a statistically significant difference,  $M = 3.42$ , 95% CI [1.08, 5.75],  $t(89) = 2.908$ ,  $p < 0.005$  supports the results. There is a no statistically significant difference between EC students ( $M = 26.93$ ,  $SD = 3.21$ ) and CC students ( $M = 24.95$ ,  $SD = 4.28$ ) for the dedication dimension. All master students participating in the study demonstrated strong motivation for their professional development during the Master program, although students participating in the PBL and tutoring programs tend to be more involved in their learning, expressing enthusiasm, pride, challenge, and inspiration (Schaufeli and Bakker,

2003). The results indicate that continuous academic support and PBL lead to a closed guidance learning process.

To test our second hypothesis (H2), a correlation analysis of responses was conducted to identify if academic engagement among master students correlated with age. The results are condensed in Table 7.

Engagement among students is significantly correlated with the age for the following dimensions: vigor (Pearson's  $R = 0.281^{**}$ ,  $p\text{-value} = 0.01$ ) and dedication (Pearson's  $R = 0.247^*$ ,  $p\text{-value} = 0.05$ ). The older the students, the more vigorous and dedicated they feel. However, the scores for absorption do not differ significantly across the age range.

## Discussion

The combined quantitatively and qualitative analysis revealed the fact that, in order to improve engagement and active participation in the learning process, academic support provided through guidance, even in online or hybrid settings where the impact of teachers is not that evident, is a significant factor. Multiple dimensions of the metacognitive skills (before engaging in a learning task, during the learning and self-reflection phase) were identified in diaries' entries of students. Even though guidance and academic support were provided by teachers, students reported difficulties in recording reflective thoughts on their learning and studying process in their reflective diaries. Despite the provision of guidance and academic support by teachers, students encountered challenges in articulating reflective thoughts about their learning and studying processes in their diaries. This discrepancy, observed in the documentation of self-reflection, prompted a closer examination of the interplay between collaborative learning, academic support, and its impact on learning awareness and academic engagement. The integration of qualitative insights from reflective diaries with quantitative data obtained from questionnaires has been a meticulous process aimed at understanding how these dimensions collectively contribute to the learning path. Our research findings suggest that a collaborative and structured learning environment, complemented by robust academic support and tutoring guidance, empowers students to take ownership of their learning experiences. The support and guidance from a 'more knowledgeable other' make the learning social and facilitate the engagement (Vygotsky, 1962, 1978). This approach not only fosters improved abilities to reflect on their learning and studying behaviors but also encourages a multidimensional understanding of these processes. The intertwining of qualitative and quantitative data reinforces the coherence and depth of our findings, aligning with the notion that these two facets should be treated as a unified entity in the analytical process.

TABLE 6 Independent sample t-test (experimental and control groups comparison).

Dimension	Mean difference	Standard error differ.	95% interval of the difference		t	df	Sig. (Bilateral)
			Lower	Upper			
Vigor (VI)	3.42	1.17	1.08	5.75	2.908	89	0.005
Dedication (DE)	1.98	0.78	0.41	3.55	2.522	89	0.013
Absorption (AB)	4.88	1.59	1.7	8.05	3.056	89	0.003

Correlation was significant at the  $p < 0.05$  level.



TABLE 7 Correlation analysis of academic engagement dimensions ( $n = 313$ ).

	1	2	3	4	5
1. Sex	1				
2. Age	-0.057	1			
3. Vigor	-0.066	0.281**	1		
4. Dedication	-0.223*	0.247*	0.792**	1	
5. Absorption	0.073	0.125	0.678**	0.659**	1

\*The correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation was significant at the 0.01 level (1-tailed).

To assess the impact of collaborative learning and the academic support on improving learning awareness and academic engagement, qualitative and quantitative data were corroborated. Considering all the data gathered, research findings suggest that a collaborative structured learning environment, sustained by a structured academic support and tutoring guidance, prompts students to take ownerships of their learning experience and improve their abilities to reflect and record their learning and studying behaviors in a multidimensional way. Our results can be corroborated by previous studies on the effectiveness of academic support in scaffolding learning in online or hybrid learning settings (Vlachopoulos and Makri, 2019; Alt and Raichel, 2020; Rotar, 2022). Alt and Raichel (2020) examined how explicit guidance can redirect students to focus on learning activities and maintain their engagement in the learning process.

The preliminary conclusions of the program implementation are as follows: firstly, academic supervision and online tutoring group attendance were good ( $n=46\%$ ), the course content improved, students' participation increased (based on the number of spontaneous questions addressed during classes; better class attendance: the students projects handed-in were done in a more structured and richer way). Students reported that during course participation, which was delivered on-line, the collaborative work based on the worksheets that they had completed during the learning process, helped them maintain their focus on the lecture, and re-engage more efficiently in the learning activities compared with lecturing alone. Descriptive statistics were then used to determine the level of academic engagement (vigor, dedication, and absorption). According to the results, the overall perspective on the student's engagement is positive; the voluntary-based participation in the experimental program implied particular motivation for learning and professional development. On the whole, during the feedback and discussion sessions of the workshops, students agreed on the positive role of peer-group learning and academic supervision. However, they reported a neutral opinion regarding the role of learning diaries in their learning process, mostly citing the time-consuming aspects of noting an in-death reflection process needed for the monitoring process.

To answer our second research question (RQ2), we analyzed learning diaries entries of students from EC to identify students' reflective skills. Setting learning goals, identifying knowledge gaps, raising questions, and reflecting on the course material provides a deeper approach to learning. Higher education is designed to enhance and stimulate higher-order thinking tasks. Our study results show that students find the process of keeping track of their learning process, identifying, and adapting their learning strategies to the objectives of

the task challenging (Karlen et al., 2014; De Bruin and van Merriënboer, 2017). Self-assessing the way the learning goals are achieved involves a deep approach to learning, which, in an appropriate ratio, challenges academic success and considerably enhances the learning engagement (Schaufeli, 2017). Learning performance depends on the intensive interaction with the course material and the guided learning path through a PBL and tutoring program. During the experiment implementation, in the online environment, providing academic supervision and a PBL and tutoring learning program raised several challenges for teachers and students (Vosniadou, 2020). In spite of these barriers, even during the online instruction, PBL and tutoring programs affected academic engagement (Bovill et al., 2016).

To assess how peer-collaborative learning increases participation and motivation among master students in the online learning environment, we gathered data from the qualitative analysis of learning diaries and correlated the results with the findings from the UWES-9S questionnaire. It is known that most of the master program experience involves independent and autonomous learning, and for the research and PBL activities extra help is needed through academic supervision and tutoring activities (Lunsford et al., 2017). Students from the EC proved to be more engaged in their learning process, more likely to experience and express enthusiasm, pride, challenge, and inspiration. Collings et al. (2014) found that students involved in a mentoring program were more likely to stay at the university, whereas non-peered mentored students expressed their intention to drop-out of the program. The validation of a PBL and tutoring program on students' engagement adds an important aspect to the existing studies in explaining master students' satisfaction and academic performance. Academic support (by providing workshops and assisting in keeping learning diaries) contributed significantly to the learning experience. Moreover, the findings determined direct positive effects on the level of engagement. Keeping learning diaries has also been used as an intervention tool, not just an assessment instrument in other studies with a positive impact on promoting monitoring (Schmitz et al., 2011). The analysis also revealed that more experienced master students (professionals working in education) were more able to reflect on their learning experience and based on the academic support provided were able to improve their study skills. Here our findings support other studies (Arco-Tirado et al., 2011). Learning correlated with relevance and explicit connection with the practical implementation increases interest and dedication to the learning process (Kasworm and Bowles, 2012).

This study was designed to provide data on learning habits and behaviors of master students and on ways to assess the usefulness of a PBL tutoring program in improving the level of academic engagement (using the data of UWES-9S) by focusing on concrete aspects of student training (e.g., academic supervision, collaborative learning, metacognitive strategies). After the implementation of PBL and the tutoring program, students from the EC group expressed higher levels of energy and effort in their studying (VI;  $M=23.18$ ,  $SD=5$ ), higher interest and dedication to the learning process (DE;  $M=26.93$ ,  $SD=3.21$ ), better concentration and enthusiasm while studying (AB,  $M=24.83$ ,  $SD=8.52$ ). Our results coincide with other research (Upadyaya and Salmela-Aro, 2013; Sulea et al., 2015; Sánchez-Cardona et al., 2016); academic supervision, PBL, and tutoring support have positive consequences for academic engagement. Academic engagement is directly linked to better academic

performance (Salanova et al., 2010). When conducting academic support during the experimental program (through workshops and guided learning diaries), students were more committed to their learning process and showed higher levels of engagement and task-involvement and were committed to significantly more interaction and common projects, confirming research hypothesis (H2). Tutoring services directed to develop freshmen students' specific skills (e.g., independent learning, cognitive and metacognitive strategies, social skills) had a positive impact on the metacognitive skills of students, with greater results on veteran students (Arco-Tirado et al., 2011). Tutoring services alone cannot ensure academic success, the investment in developing metacognitive skills in students are at the core of self-study and independent learning.

## Conclusion

Academic support and the implementation of some metacognitive procedures, such as learning diaries, enhance self-reflection and self-awareness on learning, which have a significant impact on academic engagement. The common challenge of master students is to get academic supervision and continuous academic and tutoring support, especially in the era of university hybridization. The online context challenges master students, as peer learning and tutoring are not mandatory, supervision sessions, and academic support are provided discontinuously for master thesis preparation and not always during the whole learning process, which during the master program is aimed at higher-order thinking and analytical thinking skills, found relevant by our research sample. Our study found that project-based academic supervision and tutoring have an impact on maintaining students' involvement in their learning process and on increasing the levels of academic engagement. The findings of our research resonate with findings from other studies of academic support and PBL on academic engagement. A learning model with a solid construction on continuous academic support would ensure academic engagement, by fostering social interaction, self-reflective and self-monitoring skills as an efficient interactive activity due to the engagement of all partners in the learning process. More studies on academic support and its interrelations to academic engagement online and offline are needed to clarify the appropriate ways in delivering student guidance.

## Limitations of the study

The findings of our experimental study are not exhaustive and cannot be generalized for the entire population. The small sample size of participants may limit the generalizability of our findings to a broader population. The study's outcomes may not be representative of the diverse range of students in different academic settings or disciplines. Various external factors, such as individual differences in learning styles, prior educational experiences, or external commitments, may influence academic engagement and participation. These factors, not fully accounted for in our study, could contribute to nuanced variations in the impact of interventions. The study primarily focuses on the impact of academic support and PBL on student engagement. However, engagement is a multifaceted construct influenced by numerous variables. Our study does not comprehensively explore all potential factors that may contribute to or hinder student

engagement. The study's duration, limited to a specific timeframe, may not capture the long-term effects of academic support and PBL on sustained student engagement. Future research with extended observation periods could provide a more comprehensive understanding of the interventions' lasting impact. Despite efforts to maintain objectivity, the study may be susceptible to bias. Participant self-reporting, social desirability bias, or researcher bias could influence the accuracy of the data collected, impacting the validity of our conclusions. Additional research is needed to examine how academic support and PBL can impact student engagement and how to provide supervision activities for students depending on specific competences developed for a specific study program.

## Data availability statement

The datasets presented in this study can be found in online repositories. The data is available at the following link: <https://data.mendeley.com/datasets/mmsz37rzcs/1>.

## Ethics statement

The studies involving humans were approved by the Ethics Committee of the Centre for Scientific Research in the Field of Applied Psycho-Pedagogy approved the research (protocol number: 226/12.02.2021). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

## Author contributions

MS: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Resources, Supervision, Validation, Writing – original draft, Writing – review & editing. CD: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing – original draft, Writing – review & editing. GD: Writing – review & editing.

## Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. This research was funded by University of Pitești, within CIPCS – UPIT (Internal Competition for Scientific Research Projects), grant number 1592-05-02-2021.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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